Computer systems

1st Term Assessable Activity

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**EXERCISE 1**

**Section a**

The commands to create the specified tree of folders, starting from the home directory are:

mkdir /tmp/”My Files”

mkdir /tmp/”My Files”/”Cook Recipes” /tmp/”My Files”/Comics /tmp/”My Files”/Movies

cd /tmp/”My Files”/“Cook Recipes”

mkdir Salty Sweet

touch ../Comics/”Man of Steel.txt” ../Comics/”Wonder Woman.txt”

mkdir ../Movies/Superheroes ../Movies/Comedy

**Section b**

1. **Create a file and add a text**

Commands to create the file:

Touch /tmp/”My Files”/”Cook Recipes”/Salty/”Mac and cheese.txt”

To add the text using pipes or redirection:

echo “To make macaroni and cheese, you must first buy macaroni and cheese”> /tmp/”My Files”/”Cook Recipes”/Salty/”Mac and cheese.txt”

1. **Delete the Sweet directory**

The command is:

rmdir /tmp/”My Files”/”Cook Recipes”/Sweet

1. **Copy a file to another directory and add some text**

The commands are:

cp /tmp/”My Files”/Comics/”Man of Steel.txt” /tmp/”My Files”/Movies/Superheroes/”Man of Steel\_copy.txt”

To add text:

echo “Up up and away!”> /tmp/”My Files”/Movies/Superheroes/”Man of Steel\_copy.txt”

**Section c**

1. **Create a hard link of “Man of Steel.txt” and a symbolic link of “Wonder Woman.txt”.**

Using absolute paths:

ln /tmp/”My Files”/Comics/”Man of Steel.txt” /tmp/”My Files”/Comics/”Man of Steel\_hard.txt”

ln /tmp/”My Files”/Comics/”Wonder Woman.txt” /tmp/”My Files”/Movies/Superheroes/”Wonder Woman\_soft.txt”

1. **Modify the contents of “Man of Steel\_copy.txt” and check if the contents of “Man of Steel.txt” and “Man of Steel\_hard.txt are modified. Why?**

They are not modified. “Man of Steel\_copy.txt” is a copy of “Man of Steel.txt”, but they don’t point to the same inode, they are independent files.

1. **If deleting “Man of Steel.txt”, what will happen to “Man of Steel\_hard.txt” and Man of Steel\_copy.txt”?**

Nothing. “Man of Steel\_hard.txt” will have the same content that “Man of Steel.txt” had, and “Man of Steel\_copy.txt” will have the text previously modified.

1. **Delete the Comics directory. What happens to “Wonder Woman\_soft.txt”?**

The soft link is broken. Its name appears in red, and when trying to show its content, there is an error message saying: “the file or the directory does not exist”.

This happens because the soft link is a path to the original file. If the original file is deleted, the soft link is broken, because it is not a copy pointing to the same inode as the hard link, it just contains the path to the inode. If the inode does not contain information anymore, the soft link is useless and it’s broken.

**EXERCISE 2**

**Section a**

Create the users specified with the proper requirements:

The next list of commands will create all the users, with a home directory (specified by the “-m”) and the shell /bin/sh (specified with the “-s /bin/sh” command).

sudo useradd -m -s /bin/sh gru

sudo useradd -m -s /bin/sh kevin

sudo useradd -m -s /bin/sh stuart

sudo useradd -m -s /bin/sh nefario

sudo useradd -m -s /bin/sh agnes

sudo useradd -m -s /bin/sh supermegavillain

To create a password for each user, these commands are used:

passwd gru

\* It asks for the new password: gru\_password

passwd kevin

\* It asks for the new password: kevin\_password

passwd stuart

\* It asks for the new password: stuart\_password

passwd nefario

\* It asks for the new password: nefario\_password

passwd agnes

\* It asks for the new password: agnes\_password

passwd supermegavillain

\* It asks for the new password: supermegavillain\_password

Since the exercise specified to create the users in a non-interactive way, the command useradd was selected to create the users. It allows us to create the users quicker, by specifying the options (home directory, shell, groups, others) in a single command, and we don’t need to fill in extra information for each user. With this command, we only need to create the user with “useradd” and then use an extra command, “passwd user\_name”, to assign a password to the user. Using “adduser” would take more time and would require more input from us. The password would be created, but we should manually change the shell for each user using another command.

**Section b**

To create the groups, these commands are used:

sudo groupadd masteroftheuniverse

sudo groupadd minions

sudo groupadd kids

sudo groupadd researchanddevelopment

A computer code with text

Description automatically generated

Stuart and kevin 🡪 minions 🡪 user r-- bananas/

Xxx r-- xxxUser minions bananas/

rw- r-- --- Agnes researchanddevelopment operation\_birthday/

nefario 🡪 researchanddevelopment

Gru 🡪 researchanddevelopment, minions

rw- --- --- nefario minions Science/

Gru can access anything anywhere besides from the folder operation\_birthday, which cannot see anything (not even listing the files).

Agnes can only access to operation\_birthday and she’s the only one able to write inside of it.

Nefario can access to operation\_birthday, but can’t delete anything.

The minions stuart and kevin cannot access anything besides from the folder bananas.

Nefario should only access to the science folder and should be the only one able to write in that folder.

The supermegavillain, because of a silly Gru’s mistake, can access to the evilplans.